

REMARKS

The Examiner's attention to the present application is noted with appreciation. Applicant gratefully acknowledges the allowance of claims 43-77. However, Applicant submits that all claims are allowable in accordance with the following remarks. The present claims have not been amended in any way.

Claim 1 of the present invention is stated herein for the Examiner's convenience:

1. A method of measuring parameters relating to a lithography device, the method comprising the steps of:

providing a substrate comprising a plurality of fields, each field having been exposed at a different focus value and comprising a plurality of diffraction structures formed on the substrate by a lithographic process utilizing the lithography device;

measuring a diffraction signature for each of a plurality of the diffraction structures in a plurality of fields by means of a radiation source-based tool;

determining for each field the variability of measured diffraction signatures obtained from the plurality of diffraction structures located within that field; and

comparing the variabilities associated with the fields to determine a desired parameter of the lithography device.

The Examiner rejected claims 1-28, 32, 33, and 35-42 under 35 U.S.C. 102(b) as being anticipated by Littau et al. Such rejection is respectfully traversed. Claim 1 of the present

invention requires “providing a substrate comprising a plurality of fields, each field having been exposed at a different focus value and comprising a plurality of diffraction structures”. In other words, the present invention requires that there are multiple diffraction structures in a field, each diffraction structure having the same focus value. The present invention also requires “determining for each field the variability of measured diffraction signatures obtained from the plurality of diffraction structures located within that field”; that is, determining the variability of the diffraction signatures taken from the diffraction structures having the same focus value.

These required steps are not disclosed in Littau et al. Littau et al. disclose single diffraction structures taken at different successive focus settings; see Fig. 4; col. 11, lines 18-20:

“diffraction signatures are obtained from a series of sequential different focus setting diffraction gratings”. In Littau et al., center of focus is determined by looking at the differences between diffraction signatures *taken at different focus settings*; see col. 10, lines 57-62: “The differences in diffraction signatures of the specular order, or any higher diffraction order, are analyzed by measuring the differences in diffraction signatures from one focus step to the next. The difference in diffraction signatures from one focus step to the next will become less and less as the center of focus is approached.” See also col. 11, lines 4-7: “The difference in diffraction signatures from one focus step to the next, and the determination of the center of focus, may be ascertained by visually comparing the resulting adjacent focus step diffraction signatures.”

Thus the Examiner’s assertions that Littau et al. disclose the above required elements in column 7, lines 1-20 and column 7, lines 5-15 are incorrect. In column 7, lines 1-5, Littau et al. instead disclose “a series of diffraction signatures of different diffraction gratings are obtained, the diffraction gratings having been made utilizing the lithography device, and made employing

a plurality of different focus settings". Further, in column 7, lines 9-10 Littau et al. disclose that "the differences between diffraction signatures of adjacent focus setting diffraction gratings are determined." There is no mention whatsoever of the present invention's required elements of multiple diffraction structures *having the same focus setting* and determining the variability of the diffraction signatures from those structures *having the same focus setting*.

The Examiner rejected claims 1-5, 8, 12-14, 19-22, 25-31, and 37-39 under 35 U.S.C. 102(b) as being anticipated by Singh et al. Such rejection is respectfully traversed. The argument parallels that above. Singh et al. do not disclose multiple diffraction structures having the same focus setting. Instead, they disclose multiple diffraction structures having multiple focus settings; accordingly, it cannot disclose determining the variability of diffraction signatures taken from structures having the same focus setting. See, for example, col. 4, lines 30-3: the stepper system produces "a plurality of test structures on a wafer 100 which are exposed employing the *plurality of focus and exposure conditions* stored in the memory 30" (emphasis added). See also col. 5, lines 31-33: "each test structure 185 is exposed using a unique focus and exposure condition" and col. 7, lines 61-63: "each of the test structures have profiles and other characteristics which are uniquely associated with their respective focus and exposure condition". Singh et al. then compare the signature data from each test structure to the "golden standard" data set and "the test structure data set which most closely correlates to the "golden standard" data set 50 is selected, and the focus and exposure condition associated with the selected test structure data is then employed in the stepper system 10" (col. 4, lines 41-45). See also col. 8, lines 2-6: "the characterization data corresponding to each focus and exposure condition is compared (e.g., via correlation) to the ideal characterization or "golden standard"

each focus and exposure condition is compared (e.g., via correlation) to the ideal characterization or "golden standard" characterization signature data set". Contrary to the Examiner's assertions, nowhere do Singh et al. disclose determining the variability of the diffraction signatures from those structures *having the same focus setting*.

The Examiner rejected claims 29-31 and 34 under 35 U.S.C. 103(a) as being unpatentable over Littau et al. Such rejection is respectfully traversed. As stated above, Littau et al. do not disclose determining the variability of diffraction signatures taken from diffraction structures having the same focus setting. Because the methods disclosed in Littau et al. are so substantially different from the presently claimed methods, it would not be obvious to use the claimed metrics in the practice of the presently claimed invention from the teachings of Littau et al.

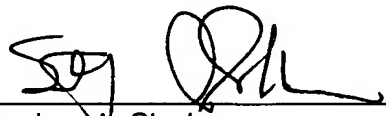
An earnest attempt has been made to respond to each and every ground of rejection advanced by the Examiner. However, should the Examiner have any queries, suggestions or comments relating to a speedy disposition of the application, the Examiner is invited to call the undersigned.

Also being filed herewith is an Information Disclosure Statement with the appropriate fee, and a Petition for Extension of Time to April 2, 2005 with the appropriate fee. Authorization is given to charge payment of any additional fees required, or credit any overpayment, to Deposit Acct. 13-4213. A duplicate of the Petition paper is enclosed for accounting purposes.

Reconsideration and allowance are respectfully requested.

Respectfully submitted,

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